

# Is In-house Composting a Practical Method of Disease Containment and Disposal for Turkeys, Breeder Operations, and Multi-level Houses?

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# Project Partnerships

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- ☐ Cargill Turkeys
- ☐ Perdue Farms
- ☐ Pilgrim's Pride
- ☐ University of Delaware
- ☐ University of Maryland
- ☐ Virginia Cooperative Extension
- ☐ Virginia Department of Agriculture and Consumer Sciences
- ☐ Virginia Department of Environmental Quality
- ☐ Virginia Poultry Federation
- ☐ Virginia Poultry Disease Task Force
- ☐ West Virginia Department of Agriculture
- ☐ West Virginia University
- ☐ **Cooperating farmer:**  
Harry Showalter

# Project Context

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- ❑ Poultry and eggs are Virginia's top agricultural sector, directly supporting about 1,200 families, 915 of which are in the Valley.
- ❑ The six poultry processing companies in the Shenandoah Valley employ more than 7,000 people.
- ❑ The poultry industry is very diverse and complex with different types of birds, operations, house designs, and aged structures.

# The Virginia Experience with Avian Influenza in 2002

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- ☐ 197 farms affected and depopulated
- ☐ 79% were turkey farms
  - ☐ 125 Commercial turkeys and 28 turkey breeders
- ☐ Remaining farms
  - ☐ 30 Commercial broiler breeders
  - ☐ 12 Commercial broiler
  - ☐ 2 layer
- ☐ 4.7 million birds depopulated
- ☐ \$7.25 million for turkey disposal
- ☐ Cost of disposal per farm = \$30,175
- ☐ Cost of disposal per ton = \$145

# **The Delmarva Experience with Avian Influenza in 2004**

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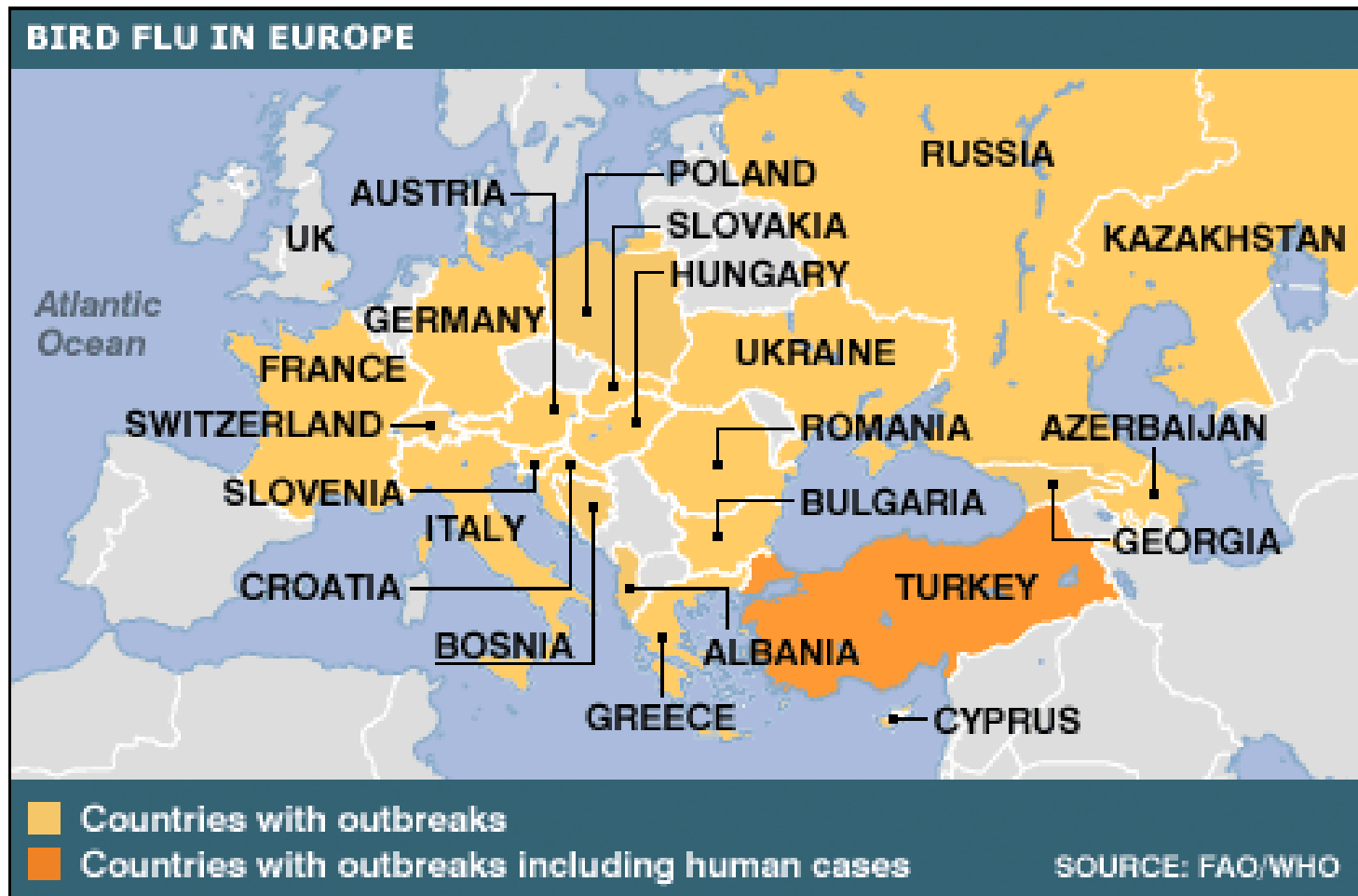
- ☐ In 2004, an avian influenza outbreak occurred on the Delmarva Peninsula.
- ☐ In-house composting was used as the disease containment and carcass disposal method on 5-pound broilers.
- ☐ Avian influenza was confined to 3 poultry farms despite being in a very concentrated poultry area.
- ☐ There were over 4 million birds within a 2-mile radius of affected farms.

# Why In-House Composting?

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- ☐ Minimizes potential groundwater pollution.
- ☐ Avoids high fuel costs and potential air pollution
- ☐ Relatively low cost when compared to landfilling
- ☐ Prevents the potential spread of disease
- ☐ No local government approval is required.
- ☐ No state permits are needed.
- ☐ A beneficial end product
- ☐ In-house composting was attempted on 2 flocks in 2002  
AI outbreak with limited success

# Bird flu in Europe and Asia has changed everything



# Working Assumption in Virginia

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- ❑ Transportation of infected carcasses off the farm to dispose of carcasses by other methods may not be permitted particularly in the case of a virulent strain of AI like H5N1 because of public perception, outcry, and health officials concern about the further spread of a highly pathogenic disease.

# Project Objectives

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- ❑ To build on the earlier success of in-house composting of broilers on the Delmarva Peninsula in 2004.
- ❑ Demonstrate in-house composting as a practicable method of disease containment and disposal for:
  - ❑ Turkeys and birds greater than 8 pounds
  - ❑ Breeder operations where space is limited
  - ❑ Multi-level and double-deck poultry houses
- ❑ Evaluate the effectiveness of different carbon material for composting

# Project Objectives (cont'd.)

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- ☐ Evaluate the effects of different carcass treatments:
  - ☐ Leaving the turkey whole versus tilling, shredding, or crushing
- ☐ Determine the minimum amount of carbon material needed to compost turkeys
- ☐ Determine effectiveness of composting when windrow height and size is less than ideal

# But, what about large birds?

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- ❑ Turkey production is more prominent in the Shenandoah Valley.
- ❑ 79% or 153 farms affected by avian influenza were turkey breeder and grow-out operations.
- ❑ Previous work and research in 1980s by J. Schwartz with 8 pound roasters.

# Non-Free Span and Turkey Housing in the Valley Complex\*

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- ❑ 243 breeder houses on 109 farms
- ❑ 144 double-deck houses on 72 farms
- ❑ 79 pole buildings on 40 farms
  
- ❑ Approximately, 900 turkey houses on 345 farms
  
- ❑ Non-free span and turkey farms account for approximately 65 to 70 % of the poultry operations in the Valley Complex.

\* Partial survey of 5 integrators and 1 breeder operation

# Treatments and Variables of Study with Turkey Carcasses

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## ☐ Carbon Materials

Used

- ☐ Hardwood Sawdust
- ☐ Woodchips
- ☐ Built-up Litter
- ☐ Starter Litter
- ☐ Blend of starter  
litter and built-up  
litter

## ☐ Birds

- ☐ Whole birds mixed  
and piled
- ☐ Shredded birds  
mixed and piled
- ☐ Crushed birds  
mixed and piled

# Whole birds mixed with sawdust

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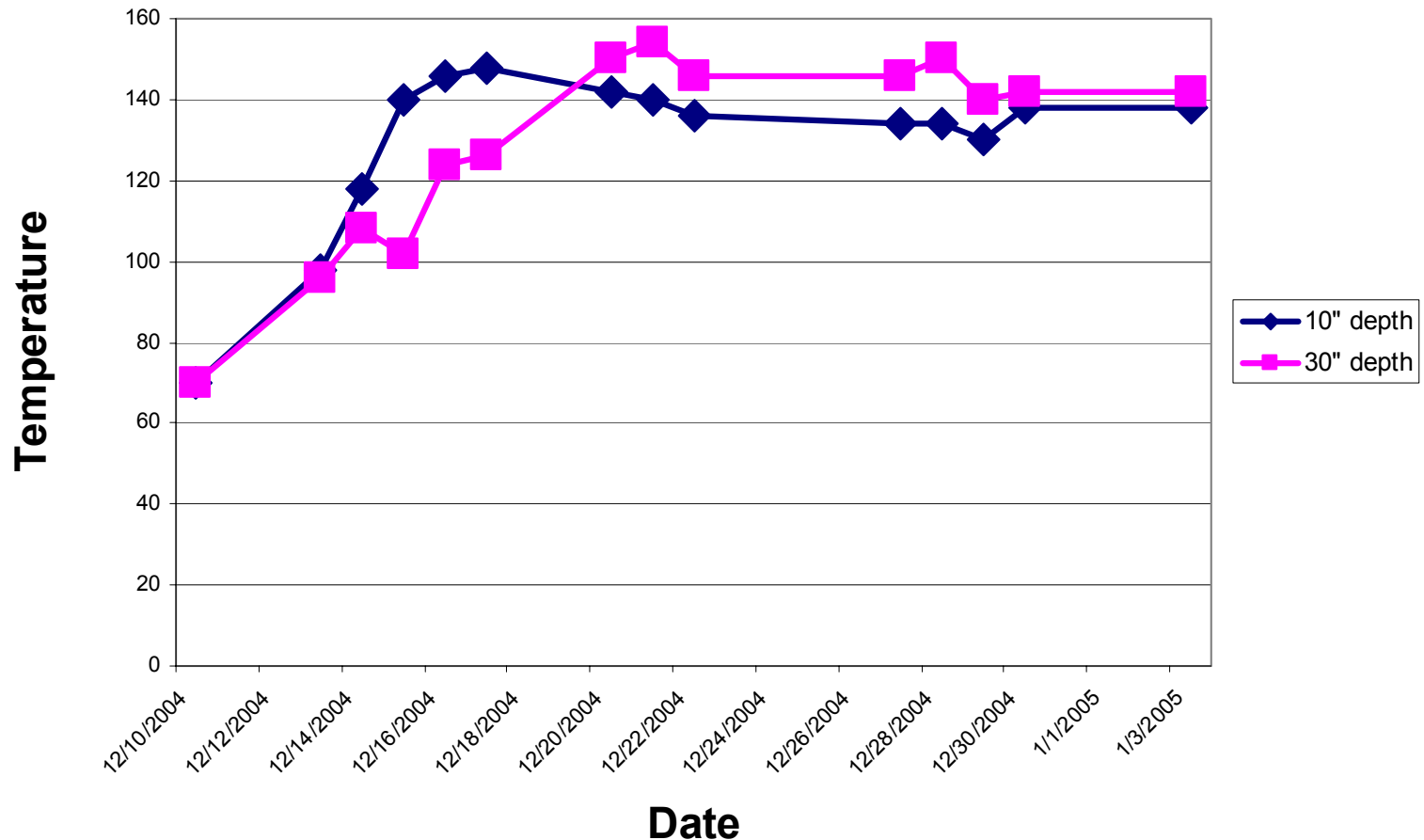
# Capping the Sawdust windrow

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# Temperature Monitoring

## Woodchips with Whole Birds



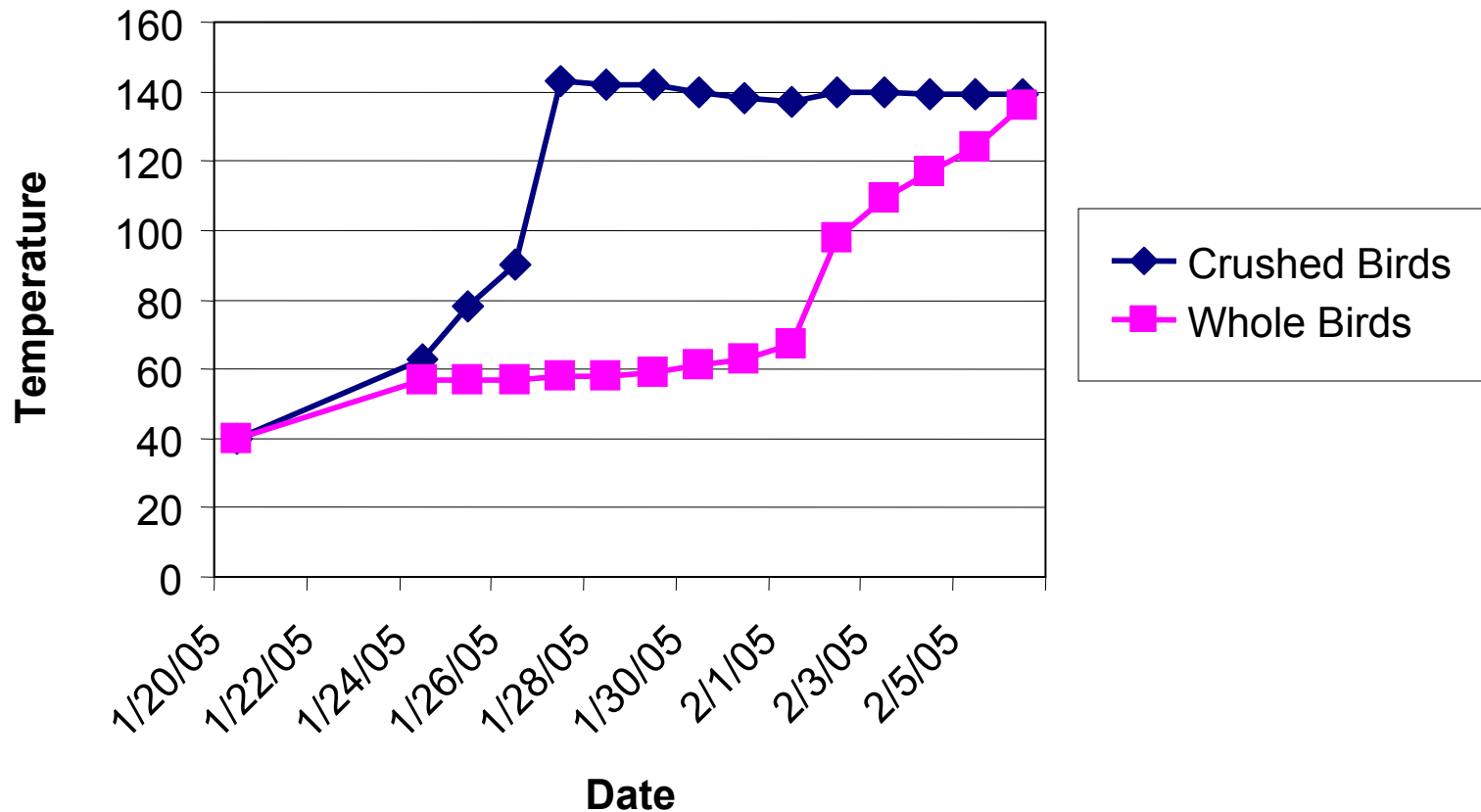
# Crushing carcasses with a skid loader

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# Temperature and Time Comparison

**Temperatures for Minimum Carbon Material Treatments**



# What about breeder, layer, and non-free span houses?

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# Non-Free Span and Turkey Housing in the Valley Complex\*

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# Constraints for In-House Composting within Breeder Operations

- ❑ Limited to composting in 13' wide scratch area
- ❑ Limited access to maneuver skid loader
- ❑ Height of houses limits ability to construct windrows of ideal width and height
- ❑ Must plan for how carbon material will be accessed during construction of windrows



# Typical Breeder Operations



# Treatments and Variables of WV Study with Breeder Carcasses

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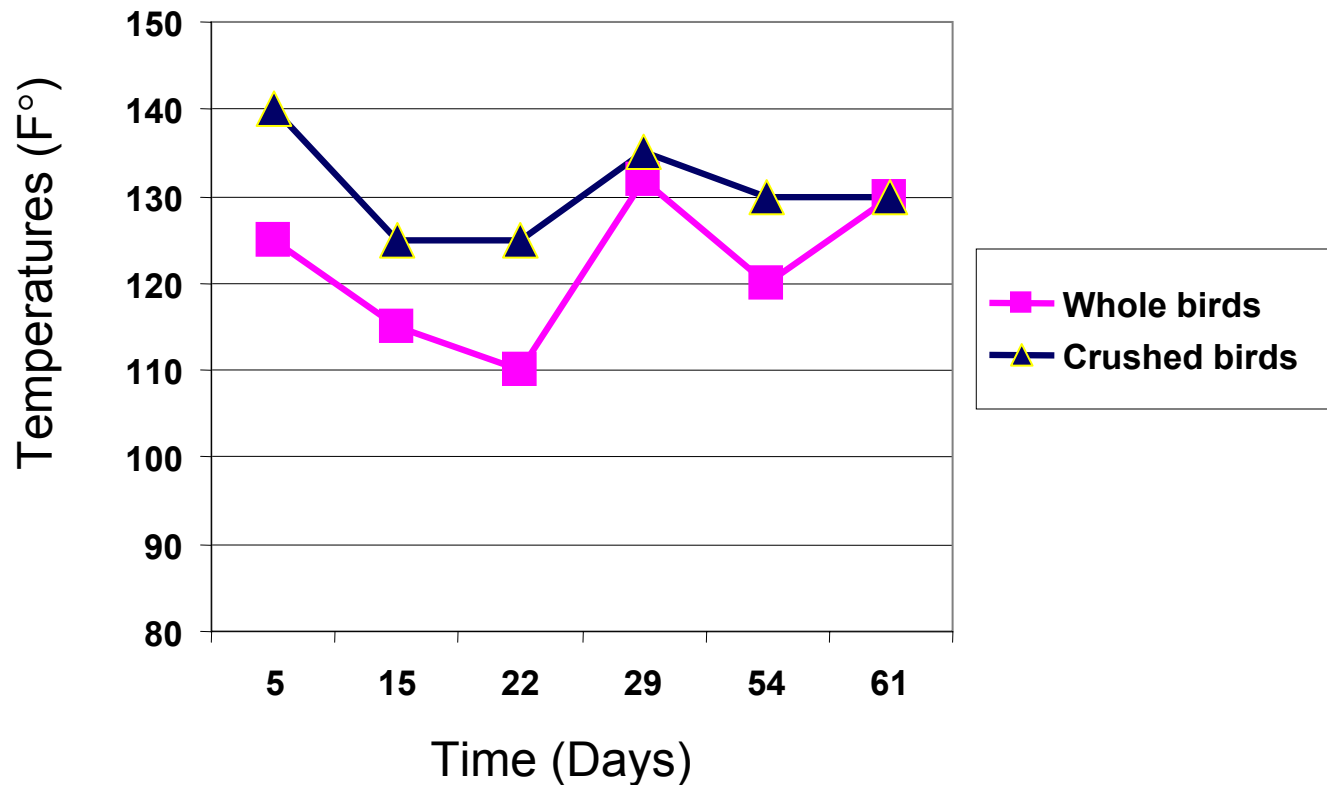
**Study initiated on April 27, 2006**

- ☐ Carbon Materials Used
  - ☐ Poultry mortality compost
- ☐ Birds
  - ☐ 8 to 9 lb. broiler breeders
  - ☐ Whole birds mixed and piled
  - ☐ Crushed birds mixed and piled (in-house and outside in storage shed)
- ☐ Work Area
  - ☐ Width = 14'
  - ☐ Length = 30'
- ☐ Euthanasia Method
  - ☐ CO<sub>2</sub> cylinder
  - ☐ Fire fighting foam

# Demonstration in West Virginia with a Breeder Operation



# Temperature Monitoring of WV Study



# Compost was ready to be moved after 3 weeks for curing and future land application

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# Results of In-House Composting of Turkeys

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- ☐ Very little remained of the turkey carcasses after two weeks and even less after being turned twice.
- ☐ Temperatures reached and maintained temperatures of at least 130 degrees for 5 days
- ☐ All four carbon materials were effective in composting (e.g., woodchips and sawdust).
- ☐ Crushing increased temperatures and the decomposition process by ~ 11 days.

## Results of WV Study

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- ☐ Carcasses can be composted in windrow heights as short as 3 ½ feet and widths as narrow as 13 feet.
- ☐ Using the same carbon source, windrow temperatures for crushed birds reached temperatures necessary for deactivating the AI virus faster than windrows with whole birds.
- ☐ Fire fighting foam used for euthanasia did not adversely affect the composting process.

# Conclusions

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- ❑ With a good base, cap, and proper disease monitoring, the compost could be turned and moved to a litter storage shed or stored under a compost fleece within 3 to 4 weeks.
- ❑ Comparable to down time experienced in 2002
- ❑ For bird carcasses greater than 4 pounds, crushing enhances the composting process, increases windrow temperatures necessary for virus deactivation, and reduces the amount of carbon material needed for composting.

# Conclusions

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- ❑ Use of firefighting foam for euthanasia does not hinder the composting process.
- ❑ Transportation of carcasses off the farm introduces additional economic, environmental, and social challenges.
- ❑ On-farm disposal methods, such as in-house composting, minimize these challenges and offer a biosecure and cost-effective option for disease containment and carcass disposal.

# Next Steps

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- ❑ On-going innovative and cooperative approaches will be critical to complement the results of these projects and additional research and preparations for on-farm disposal options.
- ❑ Sharing of key information and continued collaboration of diverse interest groups will be essential to support agriculture, protect public health, and prevent possible disease transmission.

# Contact Information

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Thank you very much!

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